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ABSTRACT

College teaching should be approached with the same careful delineation of problems and systematic attempts to find solutions which characterize research. Specific methods for the diagnosis of instructional problems include audio-video taping, use of teaching assistants, colleague assistance, classroom tests, student projects in and out of class, student notes, student ratings, self ratings, and post class session evaluations. These methods assume limited faculty time and limited additional resources such as money and expert assistance. The common theme of these methods is the opening of channels of communication for feedback regarding teaching impact. (Author/STS)

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Methods for Instructional Diagnosis with Limited Available Resources[1]

Gerald M. Gillmore and D. Joseph Clark[2]

Abstract

This report presents specific methods for diagnosis of instructional problems. These methods assume limited faculty time and limited additional resources such as money and expert assistance. In general, a systematic, continuing approach is suggested, with a common theme being the use of feedback procedures.

[1]Originally issued February, 1977 under the title "Easy and Inexpensive Methods for Instructional Diagnosis"

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Methods for Instructional Diagnosis with Limited Available Resources

Gerald M. Gillmore and D. Joseph Clark

Introduction

Adjusting to Institutional Goals and Constraints

A high quality educational experience for students is a primary goal of the University of Washington (UW), as espoused by administration, faculty, and students alike. If there are arguments about this goal, they concern the actual quality of the educational experience and the appropriate balance among the tri-partite demands on faculty time: teaching, research, and service. Rather than enter this polemic, we wish to begin by accepting that teaching effectiveness of UW faculty can be improved, and it is of value to do so. However, we are aware that the hours the faculty can devote to instructional improvement are severely limited by other, extensive demands upon their time. Campus resources for instructional improvement, in terms of money and expert assistance, are also limited. We recognize these unfortunate constraints, but we strongly feel they do not imply surrender to our present levels of teaching effectiveness. Rather, improvement methods must be tailored to fit this real situation if these methods are to be effective.

A Systematic Approach

In general we believe that our teaching should be approached with the same careful delineation of problems and systematic attempts to find solutions which characterize our research. Successful research programs invariably embody the precept that although the present state of knowledge is incomplete, an analytical understanding of it is necessary for the advancement of new and useful solutions. Similarly, we believe that in almost all cases the most efficient strategy for improving the quality of an individual's teaching is to begin with analysis of current performance. Those aspects of teaching which are good can be retained while those that are not good can be systematically altered. In only rare cases can one justify discarding everything an instructor has been doing and starting from the beginning. Thus, in systematic efforts to improve teaching, the diagnosing of instructional problems is an important first step. In diagnosing instructional problems we simply refer to identification of components of the instructional process which fall beneath some standard of quality. In this paper we present some practical methods for identifying these weaknesses.

The specific methods described are as follows: audio-video taping, use of teaching assistants, colleague assistance, classroom tests, student out-of-class projects, student in-class projects, student classnotes, student ratings, self ratings and post-class session evaluations. We do not expect that everything we suggest will be useful to everyone. Rather we present these methods as a catalogue, which some ideas may be directly useful to some faculty while other ideas may stimulate creative thought giving rise to other diagnostic strategies applicable to unique instructional contexts.

Audio-Video Taping

As instructors, we are probably our own best critics. Certainly no one else cares quite as much. Fortunately, with the aid of video-taping we can watch our own teaching performances. Not only can we use careful observation of the video recording to identify problems in teaching/lecture, but we can also build self-confidence by high-lighting positive qualities and strengths which we have failed to recognize in ourselves. Accurate assessment is essential in order to direct energies toward areas which will yield maximum improvement. Instructional Media Services can arrange for video recordings to be produced in the classroom in closed-circuit TV studios, or in the privacy of your office. The instructor has complete control of the use of the recorded performance, having the option to view it alone, share it with a colleague or professional critic, or to erase the recording. In fact, the equipment can be operated by the instructor to increase the sense of privacy, should this be an issue. Video tape can also be used for teaching practice as well as for critique.

Audio recordings do not provide as much direct feedback as video recordings, but their value should not be minimized. They can provide useful information about organization, pacing, and clarity of voice and the development of ideas. Advantages of audio recording include simplicity, availability, and ease of operation.

At the University of Washington, both audio and video recording of lectures is provided as a free service with the proviso that the tape is reviewed within two weeks and then recycled into the pool of tapes used for this special self-evaluation purpose. We wish to emphasize that the recordings are never allowed to leave the possession and/or control of the instructor without his/her express permission. For more information call Instructional Media Services (3-8198) or the Biology Learning Resources Center (3-6588).

Teaching Assistants

Teaching assistants represent a valuable resource which is often overlooked. As used in most large classes, the teaching assistants are closer to students on a daily basis and are, therefore, in a unique position to provide the instructor with valuable information about not only the progress of students in the class, but the students' perceptions of the instructor's lectures as well. Teaching assistants can also provide valuable direct feedback on the lectures. Whereas the students' judgement of what was or was not effective for them cannot be disputed, they may be less definite in localizing problem areas or suggesting alternative strategies. The teaching assistant, with more experience, can provide more positive direction and clearly defined criticisms. Such feedback requires the instructor to define carefully his/her objectives and to give the teaching assistant specific guidance in the area to be evaluated. Less benefit will accrue if the task is left completely unstructured.

In order to gain meaningful feedback from the teaching assistants, instructors must establish an atmosphere of concern and trust. Teaching assistants often feel they are employees carrying out orders with little or no direct input into the design and execution of the course. In this hierarchical arrangement, there is naturally some hesitation in providing honest and open feedback to the instructor. If you establish your sincerity and interest in your teaching assistants' own professional development as teachers and lecturers, and couple these efforts with an invitation to provide you with open feedback about your own performance, the degree of positive response will probably surprise you. If you are a member of the thesis committee for one of the graduate teaching assistants, it will require considerable personal effort to reassure the T.A. that an open and honest critique of your performance will not lead to later reprisal. Some members of the faculty of the University of Washington have successfully employed this method to increase their own teaching effectiveness. If you wish to explore this approach, the staff at the BTRC is available to assist you. However, the recognition and commitment to your own T.A.s may be quite sufficient to yield positive results.

Colleagues

Colleagues within the faculty also represent an important resource, which is generally not utilized, for improving the teaching process. While teaching seems to be a very individual matter, systematic improvement of instruction requires objective identification of those teaching parameters which are strengths and

those which are weaknesses; a task not easily performed by the person in the role. A trusted colleague can provide objective feedback, but often insights and remedies arising from additional teaching experience, or at least different teaching experience. If you choose to ask a colleague to provide feedback for your instructional performance, consider not only those within the discipline but also ones from other disciplines. The latter are similar to students in introductory courses in that they can include material that was not clear, with the added advantage that they can also suggest ways in which it might be more clearly presented, based on their own teaching experiences.

Teaching a course with a colleague, or team teaching, can be an extremely frustrating experience if there is just enough association to slow you down but not enough to provide growth and amplification of the teaching process. On the other hand, the experience can be exhilarating if the collaboration produces a superior course experience which is clearly the result of team effort. The experience can also be structured so as to lead to considerable growth and development in one's own teaching effectiveness. However, if such growth is a major goal, then your request for honest feedback and suggestions about improving your instructional effectiveness must be clearly stated in the beginning and understood by both parties. A successful experience requires a great deal of mutual support and extensive interaction. If this quality of interaction becomes difficult to achieve, often a third party can be an effective facilitator.

While we recommend the development of team teaching situations as an approach to instructional improvement, we do so with a strong warning that there should be clear directions and suitable preparation for meaningful growth to take place. A lesser approach will most likely lead to interference, which will cost you more energy than is gained by the association.

How do you choose a colleague to assist you in your efforts to improve your instructional effectiveness? If you are shy about approaching someone on the faculty because you feel it an imposition on their valuable time, you should keep in mind that a primary function of this institution is quality education, and there are few who would disagree with this in mind or spirit. Our experience indicates that almost all of our colleagues are committed to quality instruction and would willingly assist others in their efforts to improve their teaching, providing the purpose and intended outcomes were made clear at the beginning and the time commitment was clear and not excessive (e.g., 4-5 hours). If you would like to try this approach but are having trouble identifying a colleague who might help, we will be happy to assist you in finding someone.

Classroom tests

Classroom tests are often asked to serve a variety of functions. The most prominent function is providing all or part of the basis for grade assignment. Tests can perform this function, while being simultaneously informative of instructional problems.

Popular but incorrect alternatives within a multiple choice question provide evidence of student confusions which may be because your instructional message is not clear. Difficult items, as indexed by few correct answers, suggest difficult underlying concepts which perhaps require more time to cover with adequate depth. Items which everyone or nearly everyone is answering correctly may have little value for making discriminations in grading, but they may have great value in indicating that instruction is adequate in that particular area. We should add the caution that an item may appear to be difficult or easy as an artifact of poor item construction. The computerized item analyses provided by the Educational Assessment Center are very useful in providing information both to judge ones instruction and to evaluate ones items.

Essay and problem-solving test items can also be very useful in illuminating areas of student confusion and therefore indicate areas where instruction can be improved. In fact these types of items may even be more valuable than objective items since students have to construct their own answers rather than choosing among prescribed alternatives. The student's preferred and possibly incorrect alternative may not be present in a multiple choice item, so he has to take a second choice. In a free response item the student's preferred answer will appear.

Student Out-of-class Projects

Too often teachers and students are viewed as adversaries. In reality, students are more often than not eager participants in instructional improvement efforts, given the opportunity and some chance of effecting change. A teacher may wish to mobilize a small group of students (preferably more than one) to become his/her instructional development consultants. Students would be expected to gain information about the teaching in whatever ethical way possible. For example, they might wish to interview students who are and who have taken the class. They might sit in if they are not already class members. They might as fellow students have better access to student notes.

It is good if some payoff can be provided the students who work on the projects. Since money is probably not available, course credit under an independent study number might be offered with a scholarly paper to be written about the course in which conclusions must be supported by evidence.

In using this method, you will, of course, have to be able to separate the wheat from the chaff judiciously, and be able to receive criticism graciously and calmly which in some cases may be neither warranted nor diplomatically offered.

Student In-class Projects

An interesting approach to diagnosis is described by Michael Libbee in the Fall, 1976, issue of Faculty Development & Evaluation in Higher Education. We let him describe his method.

"At the beginning of a class about half-way through the semester I give each student a handout containing eight questions each with about an inch of answer space and a line drawn separating each question and answer from the next. The questions used are: (1) What is the best part of the course? (2) What is the worst part of the course? (3) How is the work load in the course? (4) How do you like the text book? (5) Evaluate the lab portion of this course. (6) Evaluate the lecture portion of this course. (7) Identify something I could do to improve my teaching. (8) Overall my evaluation of this course is:... The students are told to be both precise and honest, that their responses would be anonymous, and to write only within the space provided for each question. The students take about fifteen minutes to write an open-ended response to each of the questions. At that time questionnaires are collected and cut up so that eight piles of paper are created, each pile having all the responses to one of the questions. Each pile of questions is then given to a group of students for tabulation of the responses. The students are told to read all the answers to the questions, develop a series of categories representing major ideas that are presented in the answers, and then go back through all the responses and tabulate the responses in the categories they have created. This procedure takes approximately ten minutes with a class of 30 students. In the remaining 20 minutes the groups present the results, and the class and the instructor discuss the findings.

This procedure has a number of advantages. The questionnaire is easy to administer, and the data easy to tabulate. Unlike a university-wide instrument, this questionnaire can be uniquely designed to fit the course and the instructor. The students, since they are tabulating and analyzing the data themselves, are involved in a valuable exercise in data analysis. Because the students are able to provide feedback early and see its effects on the course and the instructor, they are likely to feel a greater sense of participation in and commitment to

course development. Moreover, I feel it is valuable for students to see the diversity of opinion that people can have about the same course and instructor. These advantages accrue in addition to the intended purpose: early identification of problem areas in a person's teaching and an early opportunity to remedy those problems" (pp 8 - 9).

Student Notes

Most students take notes while attending classes, particularly if lecturing is the primary instructional mode. These notes can be of value in assessing how your instructional messages are being received by the students. By borrowing and analyzing student notes you can assess what the students think is important (or more accurately what they think you think is important), and even how coherent your messages are.

This mode of collecting diagnostic information can be carried one step farther with some diligence on your part and some cooperation from students. Choose a few students for each class session and ask them to make notes in the margin of their notes concerning your teaching. They can indicate such things as "I don't understand", "I am confused now", "The example did not seem relevant", "So what?", etc. Many students would welcome the opportunity to provide that kind of feedback and appreciate the instructors concern.

One problem inherent in this technique is the difficulty in maintaining student anonymity. It is probably necessary to gain the student's confidence in your integrity. You will have to convince students that you will respect what they have written and not denigrate them in any way. Also, it will probably be necessary to solicit volunteers rather than requiring that notes be made available.

If your class is large, someone may be taking notes for the ASUW Lecture Notes. This publication is, of course, readily available to you and can provide important feedback. It might even be possible to review the notes with the note-taker right after the lecture, thereby giving yourself immediate feedback on your organization and clarity as well as improving the product.

Student Ratings

The Educational Assessment Center presently provides student rating forms and their processing free of charge to all University faculty. The ratings forms contain both evaluative questions of a closed nature and questions to elicit open-ended comments. There is also space for asking your own questions. All of these question types can provide diagnostic information.

There are basically two ways to look diagnostically at student responses to the closed questions. First, item means are computed such that the higher the mean the more favorable the rating. Therefore, the components of instruction in greatest need of improvement, as viewed by students, are those represented by items with the lowest means. Secondly, students respond to items on a six-point scale: Excellent, Very Good, Good, Fair, Poor, Very Poor. You may choose the response which you feel is sub-standard, and then determine what percentage of the students rated you at that point or below. Questions for which a relatively high proportion of the students rate you in a sub-standard category (say one-third or more) may represent areas of needed improvement.

In the open-ended comments, students are asked to respond to the following question: "What changes could be made to improve the teaching or content of this course?" In reading student reactions to this question, you should look for recurring themes. Keep in mind that the question is quite general and each student is using his own words. What the student chooses to say is probably only a sample from some larger number of things he could have said. A large number or proportion of students responding similarly provides a powerful message; but, if only a few students make a specific comment, you cannot infer that only those few have that complaint.

More specific probing may be necessary and can be accomplished within the student ratings system with no cost and a minimal time expenditure. First, there is space for eight closed-type item responses. By placing questions on an overhead projector, on a blackboard, or in separate handouts, students can respond to more specific questions of your choosing. Likewise more specific open-ended comments can be solicited by asking more directed questions and having students respond on the back of the yellow comment sheet. Call the Educational Assessment Center if you wish help in question writing. (3-1170).

Self-Ratings

Before having the student rating forms distributed to your students, remove two sheets for your own use. After you have left the room and while the students are filling out their own forms, use the two sheets to rate the course 1) as you think it should be rated, and 2) as you think your students are going to rate it. For the latter you can predict where the mean student response will be, but what can be more revealing is to predict the actual number of students who will choose each response category.

Upon completing your self-ratings, put them aside for future reference. When your student rating results are returned to you, pull out your own ratings and compare the two. In doing this, look for discrepancies between your self-ratings and predictions and the students' ratings. Most important are the areas in which you have overrated yourself in comparison with your students.

This method is very easy to implement, but its value may be somewhat limited in that all of us at least implicitly evaluate ourselves anyway. However, there is value in putting ourselves "on the line" in this way.

Post-Class Session Evaluations

In assessing student reaction to a specific instructional event such as a movie, a lecture, or even an explanation of a difficult concept, information should be collected as soon after the event as possible. This type of information can be gained by use of a questionnaire administered at the end of class periods, providing that the questionnaire used is reasonably brief, and student anonymity is assured. For example, at the beginning of each class period the lecture outline could be distributed to all students with a brief questionnaire attached. This questionnaire should ask very specific questions, either in an open- or close-ended format. A box can be provided at each exit into which students can deposit their completed questionnaires.

If the class is large, there is no reason why every student should be required to complete every questionnaire nor do you need to tabulate all of those questionnaires. Rather, some sort of sampling technique can be used; e.g., by seating section, by alphabet, or randomly.

It is important to note that with this method student cooperation is mandatory for success. To motivate students to continue to respond in good faith, it is desirable to give them feedback by reporting changes you have made as a result of feedback from them and by re-explaining difficult concepts where confusion is indicated.

Conclusion

We view the methods which have been presented as neither profound nor universally applicable. Each no doubt has some merit and is worthy of some consideration if not trial. If there is a common theme running through all of the methods presented it is the opening of channels of communication for feedback. Importantly, we hope that taken together they present a picture of the initial stage of instructional improvement as being neither unreasonably arduous nor conceptually enigmatic. The first step does not have to be big or complicated.

The price of considering instructional improvement as a series of small steps is that a long term commitment to the effort is necessary. The diagnosis of instructional effectiveness cannot be rationally viewed as a singular concurrence even if your probing reveals no problems. Our improvement strategy implies a careful, painstaking, and systematic approach, again much like a research program.

On the positive side, we feel the price is not great. Indeed, an unplanned benefit is likely to be increased interest in teaching. If you find your classes to be less than exciting, especially in relation to your research, perhaps some of your attitudes and strategies for research should be applied to your teaching. Making small but systematic changes and seeing the results in terms of student outcomes, and then planning the next change can also be exciting and add a valuable new dimension to your teaching and your classes.